vertical line,* indicates the essentially generalized and larval character of the order, and does not necessarily imply any nearer relationship to Neuroptera, which stands on the right, than to Coleoptera on the extreme left. The height to which the vertical bars have been carried above the plate is a rough approximation to the specialization attained by the adults, and also to the removal of the mode of development from the primitive Thysanuroid mode.

The orders existing to-day are regarded as parallel series differing from each other in structure, and not as yet connected by well-known intermediate forms. Where the probability exists that certain orders have had a common origin, they are placed on the same radiating lines, as seen in Diagram III, orders II-III; also VI-VII, and VIII-IX; and this rule has been departed from only where the data seemed to justify a more natural interpretation, as in the case of the orders from XII to XVI, inclusive.

All of these graphic presentations are necessarily extremely rough approximations to the actual facts, and present even the authors' views in a very imperfect manner. Nevertheless, if conscientiously studied, they will, it is hoped, help to give teachers some ideas of the principles upon which a classification is based, and prevent them from falling into the absurd but natural mistakes often occasioned by the linear treatment of types in the text.

LIST OF ORDERS.

I. Thysanura.	IX. Hemiptera.
II. Ephemeroptera.	X. Coleoptera.
III. Odonata.	XI. Neuroptera.
IV. Plecoptera.	XII. Mecoptera.
V. Platyptera.	XIII. Trichoptera.
VI. Dermaptera.	XIV. Lepidoptera.
VII. Orthoptera.	XV. Hymenoptera.
VIII. Thysanoptera.	XVI. Diptera.

DESCRIPTIONS OF THE LARVA AND PUPA OF SCOTOBATES CALCARATUS FABR.

BY WM. BEUTENMULLER, NEW YORK.

LARVA:—Head subquadrate, anterior angles obtusely rounded, sides moderately rounded, shining. Clypeus tranverse, about three times as broad as long, oblique. Labrum smaller than the clypeus, anterior margin rounded and beset with a few bristle-like hairs. Antennae three jointed, first joint cylindrical, about twice as long as broad; second joint considerably longer, clavate; third joint minute, cylindrical, with a few hairs at the apex. Mandibles short, stout, arcuate externally, excavate internally, apex tridentate, base with a prominent elevation with two small teeth. Maxillae subcylindrical, stout, elongate, lobe somewhat truncate at the apex with a number of bristle-like hairs. Maxillary palpi three jointed, first joint stout, cylindrical, broader than long;

* See also the diagram given by Packard in Third Rep. U. S. Ent. Com., 1883, p. 295.

second joint more slender and longer; third joint subcylindrical, thicker at the base than the apex, which is beset with minute points. Labium subquadrate, broader at the apex than the base. Labial palpi two-jointed; first joint thick, cylindrical; second joint slender, rounded at apex. Body corneous, highly polished, minutely punctured, last segment terminating in two short protuberances curved upward. Over the body are scattered a few light brown hairs. Color: head and body testaceous. Body beneath somewhat paler. Length about 25 mm. Width about 3.50 mm.

Pupa sordid white, elongated, with each of the abdominal segments at the sides provided with a flat, quadrate process. Anal segment with two rather long processes at the extremity. Thorax subquadrate, sides rounded. Head bent downward; wings folded around the sides of the body. Length 9 mm. Width 5 mm.

Lives on wood of oak, chestnut, and hickory. Collected early in April. Pupated May 18th. Imago emerged June 9th.

A New Introduction to Entomology.* —We have here a novel and suggestive book, in which the interrelationships of insects are worked out on independent lines. Neither Professor Hyatt, a zoologist and paleontologist of the very highest repute, nor his associate Miss Arms, has ever before claimed a hearing in the entomological world, and they have approached the subject quite untrammelled by tradition or authority, but with experience as successful teachers and thoroughly imbued with the principles which guide modern science. It is not a text book for scholars, but precisely what its title indicates, a guide for teachers. It abounds with novel suggestions, and is interspersed with cautions of the utmost importance to teachers. We have room here for only one passage, in which the limitations of the Darwinian theory are enforced:

"It is very important that teachers should be cautious in allowing themselves the free use of explanations which the doctrine of Natural Selection seems to furnish. The danger lies in the fascination of the logical form presented by this doctrine, the ease with which it seems to explain even the most complicated relations of organic beings, and the general although unfounded belief that it is universally accepted and believed in by naturalists. They will find . . . that this doctrine is not used by any investigators in accounting for the origin of structures and their modifications, and only to a limited extent by those quoted above and others of the same school [the so-called Neo-Lamarckians], in explaining the preservation of structures and modifications after they have been originated by the action of physical and other causes."

A diagrammatic scheme for illustrating the authors' views of the phylogeny of insects is given on a preceding page of this number, and we hope to print at an early date their concluding general remarks, after a survey of the whole field.

Recent English publications.— The fourth part of Buckton's Monograph of the British Cicadae or Tettigidae, just issued, completes the first of the two volumes of which the work will be composed. The first volume contains 41 plates and 211 pages of text, 78 of the latter given up to the Introduction. The remaining volume will treat of the Jassides, Deltocephalides and Typhlocybides of the classification adopted by him.

The fourth part of Moore's Lepidoptera Indica is of less interest than the preceding. The plates are still concerned with the Euploeinae but only with species of very similar appearance having a dull brown ground color, and of which the early stages are not known. The modification of the hind mar-

*Insecta (Guides for science-teaching, viii). By Alpheus Hyatt and J. M. Arms. 16mo, Boston, 1890. Published for the Boston Society of Natural History by D. C. Heath & Co. pp. 23, 300, figs. 223.